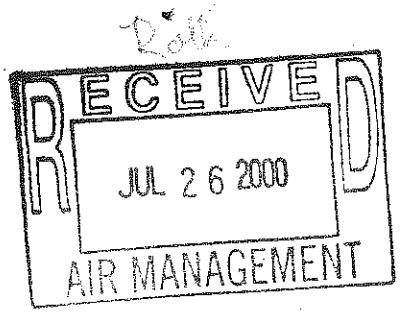
AIR QUALITY DISPERSION MODELING ANALYSES
PARTICULATE MATTER (PM) & SULFUR DIOXIDE (SO_2) EMISSIONS
LIME MANUFACTURING PLANT
MANITOWOC, WISCONSIN

FOR

ROCKWELL LIME COMPANY



D&M Job No. 44011-001

July 5, 2000

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PREPARED FOR:
ROCKWELL LIME COMPANY
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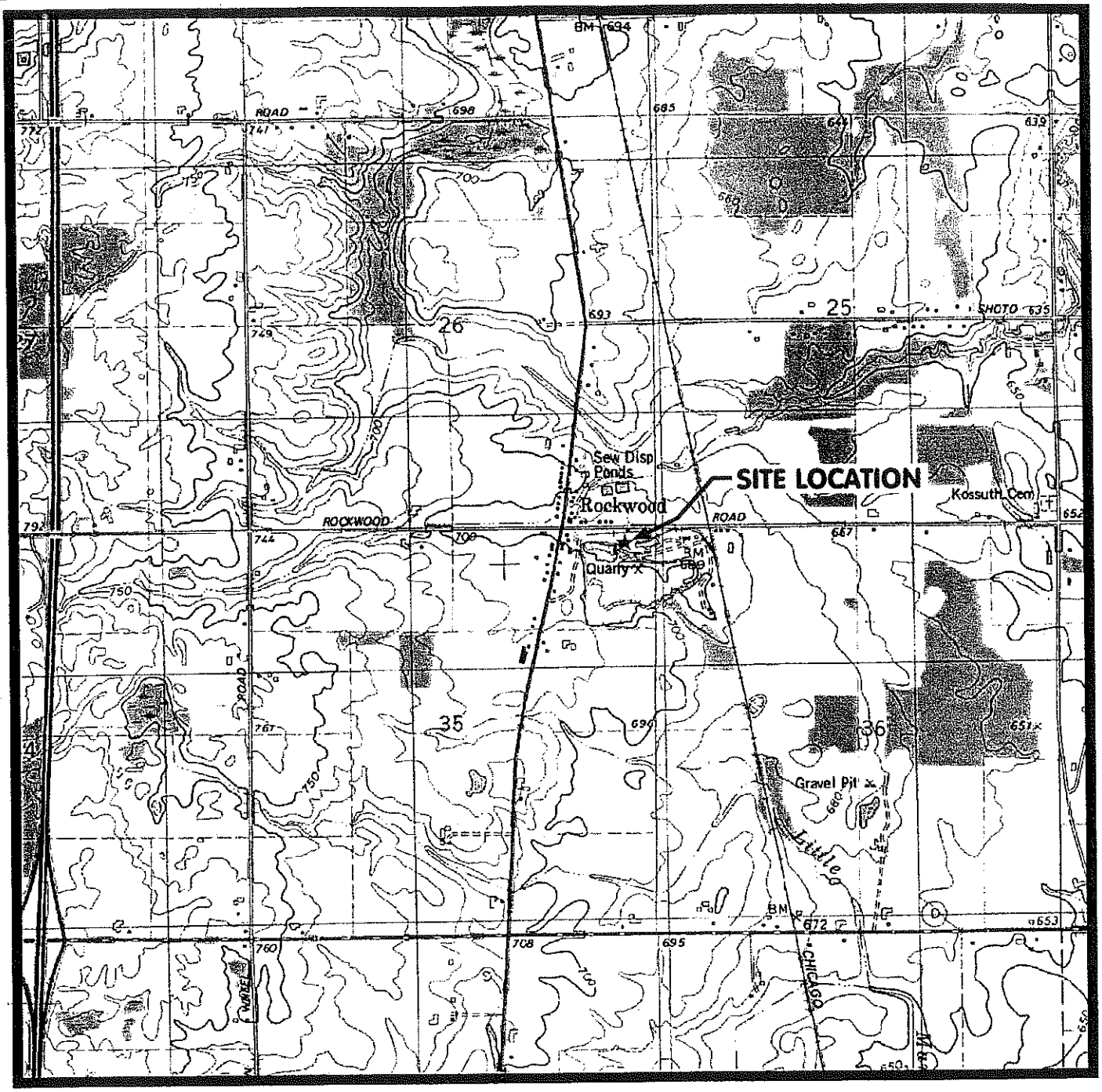
1.0 INTRODUCTION

Rockwell Lime Manufacturing company submitted a Part 70 Operating Permit application for its Manitowoc, Wisconsin lime manufacturing plant to the Wisconsin Department of Natural Resources (WDNR) during the fall of 1995. Refer to Figure 1 for the location of the Manitowoc plant. The WDNR is currently in the process of reviewing this application so that a Part 70 Operating permit can be issued for the Manitowoc plant. During this review process, the WDNR has conducted preliminary air quality impact analyses. The purpose of these analyses was to demonstrate that the air pollutant emissions rates provided in the Part 70 application would not cause or result in an exceedance of the National Ambient Air Quality Standards (NAAQS) developed for emissions of Particulate Matter (PM) AND Sulfur Dioxide (SO_2). For purposes of this report, emissions of PM have been assumed to be equal to emissions of particulates less than 10 microns in diameter (PM_{10}).

To support the air quality impact analysis conducted by the WDNR, Dames & Moore performed an independent analysis on behalf of the Rockwell Lime Manufacturing Company. This document hereby presents the outcome of the air quality impact analyses performed for emissions of PM and SO_2 from the Manitowoc Lime Manufacturing plant. Refer to Figure 2 for a site layout of the Manitowoc plant.

It should be noted that this document only addresses the impacts on PM and SO_2 air quality from the Lime Manufacturing plant associated with the Manitowoc plant. Also associated with this plant, is a stone quarry operation. This operation includes the blasting and handling of limestone for the lime manufacturing plant. The quarry operations are typically performed during the daylight hours and are independent of those operations conducted in the lime plant. Emissions of PM resulting from the quarry operation are typically short in duration and not visible above the rim of the stone quarry. Rockwell Lime Company implements various techniques and operating practices that minimize the quantity of fugitive type PM emissions associated with the quarry. Because of the complexity of a quarry operation and the fugitive nature of the PM emissions, it has been determined that the air quality impact analysis should only be performed for the PM emission sources associated with the Lime Manufacturing Plant.



SCALE: 1:24 000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

NORTH

MAP REFERENCE:

PORTION OF U.S.G.S. QUADRANGLE MAP
7 ½ MINUTE SERIES (TOPOGRAPHIC)
MISHICOT, WISCONSIN 1978

QUADRANGLE LOCATION

ROCKWELL LIME COMPANY

FIGURE 1
SITE LOCATION MAP
ROCKWOOD, WISCONSIN

DATE: SEPTEMBER 19, 1999	
JOB NO.: 44011-001-140	
DRAWN BY: MAR	CHK'D BY: SAF
SCALE: AS SHOWN	

DAMES & MOORE
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Included in this document is the following information:

- Section 2.0 provides estimates of PM and SO_2 emissions from the Lime Manufacturing plant. This emission estimates reflect worst case operating conditions;

- The Dispersion Model, Data Bases, and methodology used to conduct the air quality impact evaluation of PM and SO_2 emissions from the Lime Manufacturing plant are provided in Section 3.0;

- Section 3.0 also provides the results of the air quality dispersion model analyses performed for emissions of PM and SO_2. Associated model input and output files have been provided in the Appendix.

2.0 PARTICULATE MATTER & SULFUR DIOXIDE EMISSION ESTIMATES

Particulate Matter Emission Estimates

During the lime manufacturing process, emissions of PM and SO_2 may be generated. Emissions of PM are a result of processing and handling of the quarried stone and the manufacturing of the various lime products. For purposes of these analyses, emissions of particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) have been assumed to be identical to emissions of PM. Sulfur dioxide emissions will be generated from the combustion of sulfur bearing fuels in the plant's Number 1 & 2 lime kilns.

To estimate PM emission rates from this equipment, "AP-42" emission factors, regulatory derived emission factors, stack test results and/or vendor data were used in conjunction with the equipment design rating, hours of operation, and control device removal efficiency.

Tables 1 and 2 contain the basis for calculations of PM emissions from the various operations associated with the Lime Manufacturing plant. Information provided in these tables includes a description of the source, maximum throughput rates, emission calculations, and the maximum hourly emission rates. It should be noted that the air quality impact assessment provided in this document is based on the assumption that all of the identified air emission sources are occurring simultaneously. This is a conservative assumption, since not all process operations will be operating at the same time during a 24-hour period.

This plant has been divided into the following PM emission source categories:

- Kiln System;
- Coal Handling System for the Kiln System;
- Quicklime System;
- Hydrate & Milling Operation;
- Hydrate Lime Bagging Operation; and
- Fugitive dust from vehicle traffic within the plant.

Federal and state construction permits were issued on 1978 and 1979, authorizing construction of Kiln #2. This permit established a Best Available Control Technology (BACT) sulfur limitation of 2.1%. The calculated 24-hour SO_2 emission rate is as follows:

(Fng X Sng) + (Fc X Sc) + (fpc X Spc) + (fb X Sb) < 147.0 pounds (S) / hour

Fng = Amount of Natural Gas Used (CF)
Sng = Lbs of Sulfur / CF
Fc = Amount of Coal Used (lbs)
Sc = % Sulfur – Coal
Fpc = Amount of Petroleum Coke Used (lbs)
Spc = % Sulfur of Petroleum Coke
Fb = Amount of Coal/Pet. Coke Blend Used (lbs)
Sb = % Sulfur - Coal/Coke Blend
S = Sulfur

This equates to approximately 294 pounds of SO_2 per hour averaged over a 24-hour period. The actual rate is less due to the effect of lime scrubbing during the operation of the kiln.

The #2 Kiln is also limited to 5.5 pounds so SO_2 / MMBtu heat input averaged over a 3-hour period

5.5 lbs/MMBtu X 87.5 MMBtu/hr = 481.25 lbs of SO_2 per hour

Since the No.1 and No.2 kilns exhaust to a common stack, the combined SO_2 worst case emission rates are estimated as follows:

3-Hour Averaging Period

242 lbs/hr (Kiln #1) + 481.25 lbs/hr (Kiln #2) = 723.25 lbs/hr of SO_2 (combined) or 5.5 lbs/MMBtu

24-Hour Averaging Period

TABLE 1
Lime Manufacturing Plant
Rockwell Lime Company
Manitowoc, Wisconsin
Basis for Calculation of PM Emissions

SOURCE AND PROCESS IDENTIFICATION	OPERATION	PROCESS DESCRIPTION	BASIS FOR EMISSIONS - REFER TO ATTACHED COMMENT TABLE
KILN SYSTEM			
STACK S11, UNIT P33	**#1 KILN AT MAXIMUM CAPACITY**	6.25 TPH LIME KILN #1	1
STACK S11, UNIT P36	**#2 KILN AT MAXIMUM CAPACITY**	12.5 TPH LIME KILN #2	2
STACK S11, UNITS P33 AND P36 COMBINED	**#1 AND #2 KILNS AT MAXIMUM CAPACITY**	2 LIME KILNS COMBINED	1+2
STACK S19t, UNIT P05	**KILN STONE FEED**	FROM TOP OF SILOS S19,20	4
STACK S19b, UNIT P05	**KILN STONE FEED**	FROM BOTTOM OF SILOS S19,20	5
STACK SO7t, UNIT P05	**KILN STONE FEED**	FROM TOP OF TANK S21	6
STACK SO7b, UNIT P05	**KILN STONE FEED**	FROM STONE FED INTO KILN #1	7
STACK S22t, UNIT P05	**KILN STONE FEED**	FROM TOP OF TANK S22	8
STACK S22b, UNIT P05	**KILN STONE FEED**	FROM STONE FED INTO KILN #2	9
COAL SYSTEM			
STACK S09, UNIT P06	**COAL/COKE FEED SYSTEM**	DUST EMITTED AT TRUCK UNLOADING	12

TABLE 1
Lime Manufacturing Plant
Rockwell Lime Company
Manitowoc, Wisconsin
Basis for Calculation of PM Emissions

SOURCE AND PROCESS IDENTIFICATION	OPERATION	PROCESS DESCRIPTION	BASIS FOR EMISSIONS - REFER TO ATTACHED COMMENT TABLE
STACK S21a, UNIT P20	**POST-HYDRATION MILLING**	POST-HYDRATION MILLING	27
STACK S22, UNIT P21	**HYDRATED LIME BAGGING**	HYDRATED LIME BAGGING	28
STACK S73F, UNIT P21	**HYDRATE TRANSFER**	HYDRATE TRANSFER	29
STACK S23, UNIT P21	**HYDRATE BULK LOADOUT**	HYDRATE BULK LOADOUT	30
STACK S79F, UNIT P21	**ATMOSHERIC HYDRATE CONVEY AND BULK LOADOUT FROM BUTLER BIN**	ATMOSPHERIC HYDRATE CONVEY AND BULK LOADOUT FROM BUTLER BIN	32
UNPAVED ROADS			
S24-FUGITIVE	**UNPAVED ROADS (5 VOLUME SOURCES)**		33
		Bulk Trailer	
		Bulk Trailer	
		Flat Bed	
		Van	
		Front End Loader	
		Haul Truck	

TABLE 2
Lime Manufacturing Plant
Rockwell Lime Company
Manitowoc, Wisconsin
Basis for Calculation of PM Emissions (comments)

1 Emissions based on maximum capacity of 6.25 tons of quicklime production per hour (12.5 tons stone feed/hr) and 1.72 ton/hr coal/coke/natural gas blend. PM10 emission factor: 0.327 lbs/ton of lime produced (Emission factor based on TSP emissions factor (from permit 93-RV-108) and AP-42 Table 11.17-7, particle size distribution for a lime kiln with a fabric filter baghouse. 55% by weight of TSP is less than 10 micron particle size).
0.327 lbs PM10/ton lime x 6.25 tons lime/hr = 2.05 lbs/hr

2 Emissions based on same principle as above but with a maximum capacity of 12.5 tons of quickliem production per hour.
0.327 lbs PM10/ton lime x 12.5 tons lime/hr = 4.09 lbs/hr

4 Emissions based on 250 TPH Stone Feed and emission factor of 0.0015 lbs/ton which is used to estimate conveyor emissions. It is derived from 2.1 x 0.00072 lbs PM10/ton (SCC 3-05-020-06). Emissions from feeding Kiln #1 are modeled since stack heights are slightly lower.
250 tph x 0.0015 lbs/ton = 0.38 lb/hr

5 Emissions based on same principle as #4 with a 12.5 TPH Stone Feed rate
12.5 tph x 0.0015 lbs/ton = 0.019 lbs/hr

6 Emissions based on same principle as #5
12.5 tph x 0.0015 lbs/ton = 0.019 lbs/hr

7 Emissions based on same principle as #5
12.5 tph x 0.0015 lbs/ton = 0.019 lbs/hr

8 Emissions based on same principle as #4
250 tph x 0.0015 lbs/ton = 0.38 lbs/hr

9 Emissions based on same principle as #4 with a 25 TPH Stone Feed rate
25 tph x 0.0015 lbs/ton = 0.0375 lbs/hr

12 Emissions based on 250 Tons per 24 hour perod Coal/Coke Feed System Rate. Emission factor of 0.007 lb/ton coal crushed used (SCC 3-05-010-40)
250 tons per 24 hour period x 0.007 lbs/ton = 0.073 lbs/hr

13 Emissions based on 10.4 TPH Fuel Feed Rate (both kilns combined). Emission factor of 0.11 lb/ton coal crushed used (SCC 3-03-003-10)

TABLE 2
Lime Manufacturing Plant
Rockwell Lime Company
Manitowoc, Wisconsin
Basis for Calculation of PM Emissions (comments)

0.09 tpy x (2000 lbs/ton) x (1/8760) = 0.02 lbs/hr

28 Emissions based on uncontrolled PM emissions factor from AP-42 Table 11.17-4 of 2.2 lbs/ton product transfer and conveying and 99% control
40 TPH quicklime
40 tph x 2.2 lbs/ton x (1-0.99) x (16 hrs/24 hrs)= 0.59 lbs/hr

29 Emissions based on uncontrolled PM emissions factor from AP-42 Table 11.17-4 of 2.2 lbs/ton product transfer and conveying and no controls
20 TPH quicklime
20 tph x 2.2 lbs/ton X (1-0.98) = 0.88 lbs/hr

30 Emissions based on uncontrolled PM emissions factor from AP-42 Table 11.17-4 of 0.61 lbs/ton for loading, enclosed truck
95% of the dust is captured and controlled at a 98% efficiency
20 TPH quicklime
20 tph x 0.61 lbs/ton x (1-0.98) = 0.24 lbs/hr

32 Emissions based on uncontrolled PM emissions factor from AP-42 Table 11.17-4 of 0.61 lbs/ton for loading, enclosed truck
12 TPH quicklime
12 tph x 0.61 lbs/ton X (1-0.98)= 0.9 lbs/hr

33 Emissions based on 12,300 total vehicle miles travelled and driving is only done half a day
12,300 vmt / 8760 hrs/yr x 12 hrs per day/24 hrs per day= 0.702 lbs/hr

TABLE 3
Lime Manufacturing Plant
Rockwell Lime Company
Manitowoc, Wisconsin
Individual Stack Data for PM Emissions

SOURCE AND PROCESS IDENTIFICATION	OPERATION	ISC SOURCE #	SOURCE NUMBER ON FIGURE 3	PROCESS DESCRIPTION	EMISSIONS - LBS/HR	EMISSIONS - G/S	STACK HEIGHT (M)	STACK TEMPERATURE (K)	STACK VELOCITY (M/S)	STACK DIAMETER (M)
STACK S33, UNIT P06	COAL/COKE FEED SYSTEM	48	11	COAL/COKE DUST FROM CRUSHER C33 - VOLUME SOURCE	0.057	0.0072	2.13	-	-	-
STACK SD21	BAGHOUSE (CO1) ASH REMOVAL	51	14	CONVEYANCE	0.13	0.02	21.34	297.04	19.41	0.30
STACK SD25	BAGHOUSE (CO1) ASH REMOVAL	52	15	TRUCK LOADING	0.23	0.03	5.49	297.04	19.41	0.30
STACK S24, UNIT P10,12	QUICKLIME SCREENING	53	16	QUICKLIME SCREENING	0.88	0.11	15.24	297.04	27.35	0.34
STACK S65, UNIT P10	QUICKLIME TRANSFER	54	17	QUICKLIME TRANSFER (95% CAPTURE)	0.88	0.11	28.96	297.04	19.90	0.30
STACK S30, UNIT P10	QUICKLIME LOADOUT	56	18	QUICKLIME LOADOUT (95% CAPTURE)	0.66	0.08	4.27	297.04	16.04	0.34
HYDRATE & MILLING										
STACK S12, UNIT P37	ATMOSPHERIC HYDRATOR	58	19	ATMOSPHERIC HYDRATOR	0.80	0.10	22.86	360.93	4.04	0.61
STACK S17, UNIT 11	QUICKLIME MILLING AND TRANSFER	59	20	QUICKLIME MILLING AND TRANSFER TO PRESSURE HYDRATOR	0.70	0.09	12.19	297.04	28.04	0.18
STACK S13a, UNIT P38	PRESSURIZED HYDRATOR	7A	1	PRESSURIZED HYDRATOR	4.00	0.50	24.99	338.71	9.44	0.70
HYDRATE LIME BAGGING										
STACK S21a, UNIT P20	POST-HYDRATION MILLING	7B	2	POST-HYDRATION MILLING	0.02	0.0025	3.05	297.04	34.23	0.34

3.0 DISPERSION MODEL, DATABASES, AND ANALYSES FOR AIR QUALITY IMPACT EVALUATION

To determine the impacts of PM and SO_2 emissions from the Lime Manufacturing Plant on ambient air quality surrounding the Manitowoc plant, an air quality dispersion modeling analysis was performed. The purpose of the analysis was to demonstrate that the potential emissions of PM and SO_2 from the lime manufacturing operations at the Manitowoc plant would not exceed the National Ambient Air Quality Standards (NAAQS) developed by USEPA for these emissions. The standards developed for the air pollutants PM and SO_2 are as follows:

Pollutant	***Averaging Period***	***Standard***
PM	Annual	50 micrograms per cubic meter
PM	24-Hour	150 micrograms per cubic meter
SO_2	Annual	80 micrograms per cubic meter
SO_2	3-Hour	1300 micrograms per cubic meter
SO_2	24-Hour	365 micrograms per cubic meter

A detailed description of the modeling approach and data requirements for the assessment of PM and SO_2 air quality impacts, due to the Manitowoc Lime Manufacturing plant is included in this section.

3.1 Description of Air Quality Dispersion Model

The air quality modeling analyses employed was the USEPA's Industrial Source Complex (ISC3) model (USEPA, 1995a). The ISC3 model is recommended as a guideline model for assessing the impact of aerodynamic downwash (40 CFR 40465-40474).

The ISC3 model (Version 99155) consists of two programs: a short-term model (ISCST3) and a long-term model (ISCLT3). The difference in these programs is that the ISCST3 program utilizes an hourly meteorological data base, while ISCLT3 is a sector-averaged program using a frequency

- Capability of selecting the higher of the simple and complex terrain calculations on an hour-by-hour, source-by-source, and receptor-by-receptor basis for receptors in intermediate terrain (*i.e.*, terrain between release height and plume height).

Details of the algorithms employed by ISC3 may be found in the User's Guide for ISC (USEPA, 1995a). The regulatory default option was selected such that USEPA guideline requirements were met.

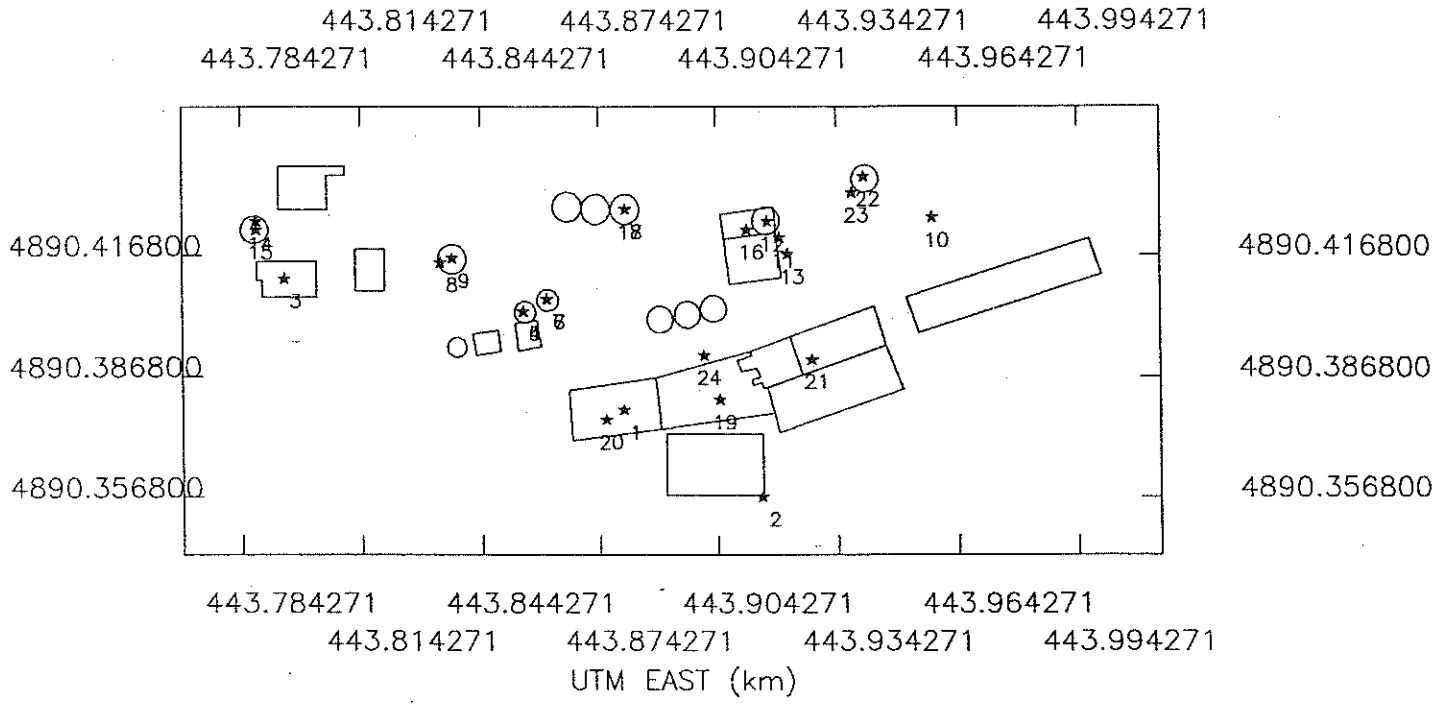
Emission sources at the plant will be influenced by aerodynamic downwash. Since downwash is a function of projected building width and height, it is necessary to account for the changes in building projection as they relate to changes in wind direction. Once these projected dimensions are determined, they can be used as input to the ISC3 model.

In October 1993, USEPA released the Building Profile Input Program (BPIP) to determine wind direction - dependent building dimensions. The BPIP algorithms as described in the User's Guide (USEPA, 1993), have been incorporated into the commercially available BREEZEWAKE program. The BREEZEWAKE program was used to determine the wind direction-dependent building dimensions for input to the ISC3 model.

The BPIP program builds a mathematical representation of each building to determine projected building dimensions and its potential zone of influence. These calculations are performed for 36 different wind directions (at 10-degree intervals). For example, the BPIP building dimensions for a wind direction orientation of 30 degrees will be used for wind directions between 26 and 35 degrees. If the BPIP program determines that a source is under the influence of several potential building wakes, the structure or combination of structures which has the greatest influence (h_b + 1.5 l_b) is selected for input to the ISCST3 model. Conversely, if no building wake effects are predicted to occur for a source for a particular wind direction, or if the worst-case building dimensions for that direction yield a wake region height less than the source's physical stack height, building parameters are set equal to zero for that wind direction. For this case, wake effect algorithms are not exercised when the model is run. The building wake criteria influence zone is 5 l_b downwind, 2 l_b upwind, and 0.5 l_b crosswind.

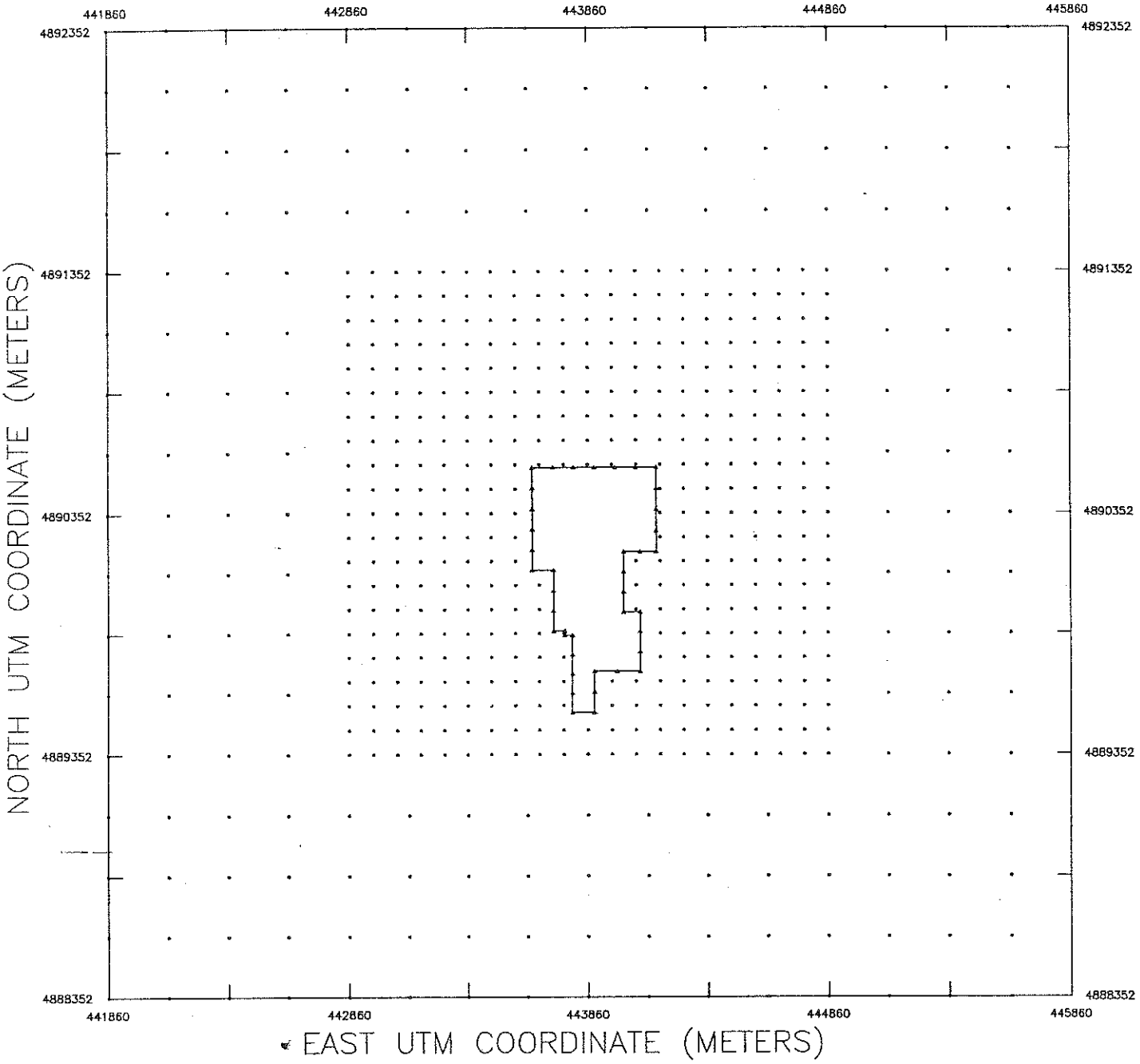
FIGURE 3

BUILDINGS AND STACKS



★ SOURCE IN ISC MODEL (REFER TO TABLE 3)
10

FIGURE 4 – ROCKWELL LIME RECEPTOR GRID



concentrations are added to the appropriate background concentration and compared to the NAAQS for 24-hour averages and the highest annual concentrations are added to the annual background concentration and compared to the NAAQS for annual averages. Results from these analyses are presented in greater detail in Table 4.

The results of the dispersion modeling analysis conducted for emissions of SO_2 show that the concentrations from the plant, along with background concentrations provided by the WDNR (10.2 ug/m^3 for annual averages, 138.6 ug/m^3 for 3-hour averages and 60 ug/m^3 for 24 hour averages), are below the National Ambient Air Quality Standards (NAAQS). Per EPA guidance, the high second high 3 and 24-hour concentrations are added to the appropriate background concentrations and compared to the NAAQS for the 3-hour and 24-hour averages and the highest annual concentrations are added to the annual background concentration and compared to the NAAQS for annual averages. Results from these analyses are presented in Table 5.

The analysis conducted for SO_2 emissions showed that based on an hourly emission rates of 536 pounds and a kiln exhaust stack height of 77 feet, predicted concentration would be in excess of the 24-hour NAAQS of 365 ug/m^3. . To reduce the predicted concentrations, increasing the height of the kiln exhaust stack was investigated. Based on this investigation, Rockwell Lime Company is proposing to increase the height of the kiln exhaust stack to 84 feet above grade. Raising the stack to this height will result in predicted concentrations that would be below the corresponding SO_2 NAAQS.

The analysis conducted for SO_2 emissions incorporating a kiln exhaust stack of 84 feet above grade resulted in predicted concentration slightly over the NAAQS of 1300 µg/m^3. Subsequently, to reduce these predicted concentrations, the SO_2 emission rate for Kilns #1 and #2 was reduced from 5.5 lbs/MMBtu to 5.4 lbs/MMBtu. This emission rate shows predicted concentrations that are below the corresponding SO_2 NAAQS.

TABLE 5

ROCKWELL LIME MANUFACTURING COMPANY
SUMMARY OF MAXIMUM PREDICTED SO2 CONCENTRATIONS
FROM THE MANITOWOC LIME MANUFACTURING PLANT

AVERAGING PERIOD	DATA PERIOD			RECEPTOR LOCATION (KM)		MAXIMUM PREDICTED CONCENTRATION ($\mu g/m^3$)	BACKGROUND CONCENTRATION ($\mu g/m^3$)	TOTAL CONCENTRATION ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
	YEAR	DAY	HOUR ENDING	EAST	NORTH				
ANNUAL HIGHEST	1983	-	-	443.630	4890.285	11.6	10.2	21.80	80
ANNUAL HIGHEST	1984	-	-	443.860	4890.552	14.4	10.2	24.60	80
ANNUAL HIGHEST	1985	-	-	443.860	4890.552	11.6	10.2	21.80	80
ANNUAL HIGHEST	1986	-	-	443.860	4890.552	11.8	10.2	22.00	80
ANNUAL HIGHEST	1987	-	-	443.630	4890.200	9.9	10.2	20.10	80
24-HOUR HI 2ND HI	1983	27-Feb	-	443.860	4890.552	263.4	60	323.40	365
24-HOUR HI 2ND HI	1984	3-Jan	-	443.860	4890.552	236.1	60	296.10	365
24-HOUR HI 2ND HI	1985	3-Mar	-	443.630	4890.370	276.1	60	336.10	365
24-HOUR HI 2ND HI	1986	22-Mar	-	443.860	4890.552	275.4	60	335.40	365
24-HOUR HI 2ND HI	1987	14-Feb	-	443.630	4890.200	232.5	60	292.50	365
3-HOUR HI 2ND HI	1983	9-Nov	6	443.630	4890.285	1021.1	138.6	1159.70	1300
3-HOUR HI 2ND HI	1984	8-Jun	12	443.973	4890.540	1065.8	138.6	1204.40	1300
3-HOUR HI 2ND HI	1985	3-Mar	24	443.630	4890.370	1153.6	138.6	1292.20	1300
3-HOUR HI 2ND HI	1986	4-May	18	443.887	4890.540	894.4	138.6	1033.00	1300
3-HOUR HI 2ND HI	1987	23-Jul	15	443.973	4890.540	877.0	138.6	1015.60	1300

APPENDIX

BPIP INFORMATION AND ISC INPUT/OUTPUT

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: November 1, 1999

File Code: 4530
FID #: 436034390

TO: Jeff Hanson - AM/7

FROM: John Roth - AM/7

SUBJECT: Addendum to October 27, 1999 Air Dispersion Analysis for Rockwell Lime - Rockwood

A revised modeling analysis for Rockwell Lime in Rockwood was completed on November 1, 1999. This revision was necessary due to a correction in the emission rates for paticulate matter from stack S17. Changes to the concentrations and the source parameters are highlighted in the tables below. The rest of the modeling assumptions are listed in the October 27, 1999 memo.

Modeling Analysis Results
(All Concentrations in $\mu g/m^3$)

	TSP - 24 hr	PM_{10} - 24 hr	PM_{10} - Annual
Source Impact	**39.2**	**22.0**	**3.43**
PSD Increment	-	30.0	17.0
% Consumed	-	**73.3**	**20.2**
Background	74.0	60.0	23.0
Total Concentration	**113.2**	**82.0**	**26.4**
NAAQS (AAQS)	150.0	150.0	50.0
% NAAQS (AAQS)	**75.5**	**54.7**	**52.8**

ROCKWELL LIME - ROCKWOOD
Stack Parameters

ID	LOCATION (M)	HEIGHT (M)	DIAM (M)	VELOCITY (M/S)	TEMP (K)
S17	51, 12	12.19	0.65	2.20	294.0
S13A	13, 8	22.55	0.70	9.43	338.6
S21A	47, -14	3.05	0.34	32.42	294.0
S21B	36, -16	22.86	0.76	20.70	294.0

ROCKWELL LIME - ROCKWOOD
Emission Rates

ID	PM RATE (#/HR)	PM_{10} RATE (#/HR)	CaO RATE (#/HR)	$Ca(OH)_2$ RATE (#/HR)
S17	**0.50**	**0.05**	0.23	-
S13A	4.00	2.80	-	1.40
S21A	0.52	0.03	-	0.30
S21B	0.52	0.03	-	0.30